

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
 Organization
 International Bureau



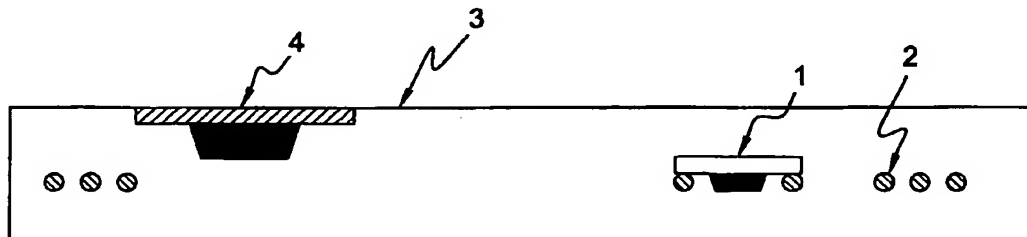
(43) International Publication Date
 1 April 2004 (01.04.2004)

PCT

(10) International Publication Number
WO 2004/027863 A2

- (51) International Patent Classification⁷: **H01L 23/00** (74) Common Representative: **SCHLUMBERGER SYSTÈMES**; C/O Vincent YQUEL, 50, avenue Jean Jaurès, F-92120 Montrouge (FR).
- (21) International Application Number: **PCT/IB2003/004011**
- (22) International Filing Date:
 17 September 2003 (17.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
 02292279.3 ✓ 17 September 2002 (17.09.2002) EP
 02292278.5 ✓ 17 September 2002 (17.09.2002) EP
 02292344.5 ✓ 24 September 2002 (24.09.2002) EP
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (*for all designated States except US*): **SCHLUMBERGER SYSTÈMES** [FR/FR]; 50, avenue Jean Jaurès, F-92120 Montrouge (FR).
- (71) Applicant (*for MC only*): **SCHLUMBERGER MALCO INC.**, [US/US]; 9800 Reistertown Road, Owing Mills, MD 21117 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (*for US only*): **THEVENOT, Benoît** [FR/FR]; 97 Allée Maurice Ravel, F-45160 Olivet (FR).
- Published:
 — without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: **HYBRID CARD**



(57) Abstract: A card like object comprises a card body (3) comprising a first face. The first face is at least partially graphically personalized. An antenna (2) is embedded in the card body (3). The card body (3) is provided with a cavity. The cavity comprises a contact chip (6). The cavity further comprises a contactless chip (7), the contactless chip (7) being electrically connected to the antenna (2) with connecting means (9).

WO 2004/027863 A2

Hybrid card

Field of the invention

The invention concerns hybrid cards. "Hybrid cards" stands here for cards
5 including a chip with its ISO 7816 contact interface and a second chip with
its ISO 14443 contactless interface.

Background of the invention

Generally hybrid cards are graphically personalized on their surface by
10 means of, for example, dye thermal transfer printers. As illustrated in
figure 1, conventional hybrid cards comprise a contactless chip and a
contact chip.

The contactless chip (1) is connected to an antenna (2), either directly by
means of the flip-chip technology, or indirectly if it is encapsuled into a
15 module that is connected to the antenna by means of either welding,
brazing or conductive adhesive based technologies. The antenna is a set of
loops that may be either constituted of wound wires, either printed by
way of additive or subtractive processes. The antenna and the contactless
chip or contactless module are embedded in the card body (3).

20 The contact chip is connected to contact areas located as defined in the ISO
7816 standard. This chip is most generally encapsuled in a module (4).

Summary of the invention

An object of the invention is to both allow reducing of the costs and to
25 obtain hybrid cards with an enhanced quality.

According to one aspect of the invention, a card like object comprising a
card body comprising a first face, the first face being at least partially
graphically personalized, an antenna being embedded in the card body,

the card body being provided with a cavity, the cavity comprising a contact chip, is characterized in that the cavity further comprises a contactless chip, the contactless chip being electrically connected to the antenna with connecting means.

5

Conventional hybrid card manufacturing technologies do not fully comply with dye thermal transfer printing process due to the surface unevenness defect induced by the contactless chip or contactless module located in the thickness of the card body.

- 10 As a matter of fact, the difference between the coefficients of thermal expansion of the chip or the module and the plastic materials composing the card body causes a local non-homogeneity of the shrinkage that appears during the cooling step of the lamination process. As shown in figure 2, this non-homogeneity is itself responsible for a local unevenness
- 15 defect (5) at the surface of the card. This surface defect causes a fading of the dye transfer printed colors.

Thanks to the invention, the contactless chip is not placed within the thickness of the cardbody. Only one cavity needs to be created in the

20 cardbody. The manufacturing process is thus easier. In addition, the card body has less local non-homogeneity on its surface. The hybrid cards can therefore be graphically personalized with an enhanced quality using, for example, a dye thermal transfer printing process.

Finally the hybrid card according to the invention allows both reducing of

25 the costs and obtaining hybrids cards with an enhanced quality.

Brief description of the drawings

Figure 1 illustrates a conventional hybrid card;

Figure 2 illustrates local non-homogeneities in a conventional hybrid card;

Figure 3 illustrates a first embodiment according to the invention; and

5 Figure 4 illustrates a second embodiment according to the invention.

Detailed description

As illustrated in figure 3, a contact chip (6) is connected to the ISO 7816 contact areas (11) of a module (0) by means of bonded wires. A contactless
10 chip (7) is stacked upon the contact chip (6) and is connected to conducting tracks (8) at the backside of the module (0) by means of bonded wires. The conductive tracks (8) are connected to antenna contact areas (10) by means of conducting adhesive filled holes (10).

15 In an other embodiment, as illustrated in figure 4 , the contact chip (6) is connected to the ISO 7816 contact areas of the module by means of bonded wires. Contactless chips (7) and (7 bis) are placed side-by-side with the contact chip (6) and are connected to the conducting tracks (8) at the backside of the module by means of bonded wires. The conducting tracks
20 (8) are connected to antennas contact areas (10) by means of conductive adhesive filled holes (9).

The description hereinbefore describes a card like object comprising a card body comprising a first face, the first face being at least partially
25 graphically personalized, an antenna being embedded in the card body, the card body being provided with a cavity, the cavity comprising a contact chip, wherein the cavity further comprises a contactless chip, the contactless chip being electrically connected to the antenna with connecting means.

The contact chip and the contactless chip can be stacked. But they can also be in a side-by-side configuration.

The connecting means can be bonding wires, conducting track, a
5 conducting adhesive, a liquid, or/and any other means or combination of these means.

The card body is made, for example, of plastic material in particular PET, PC, PVC or any other well-known material.

Claims

- 5 1. A card like object comprising a card body comprising a first face, the first face being at least partially graphically personalized, an antenna being embedded in the card body, the card body being provided with a cavity, the cavity comprising a contact chip, wherein the cavity further comprises a contactless chip, the contactless chip being electrically connected to the antenna with
10 connecting means.
2. A card like object according to claim 1, wherein the connecting means is a conductive track.
3. A card like object according to claim 1, wherein the connecting means is a conductive adhesive.
- 15 4. A card like object according to claim 1, wherein the connecting means is a metallic wire.
5. A card like object according to claim 1, wherein the connecting means is a liquid.
- 20 6. A card like object according to claim 1, wherein the contact chip and the contactless chip are in a stacked configuration.
7. A card like object according to claim 1, wherein the contact chip and the contactless chip are in a side-by-side configuration.

1/1

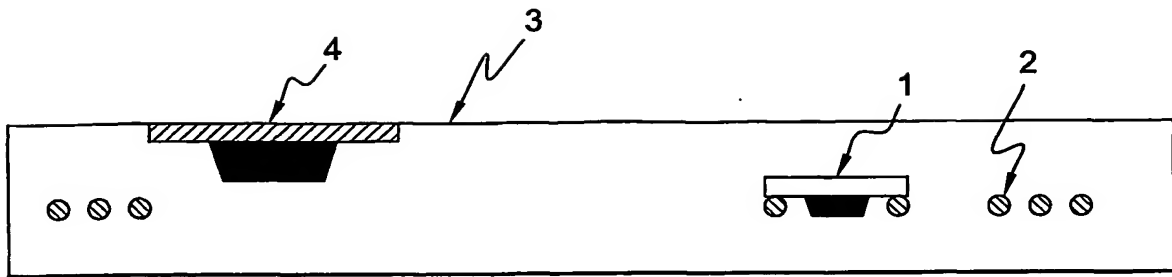


Fig. 1

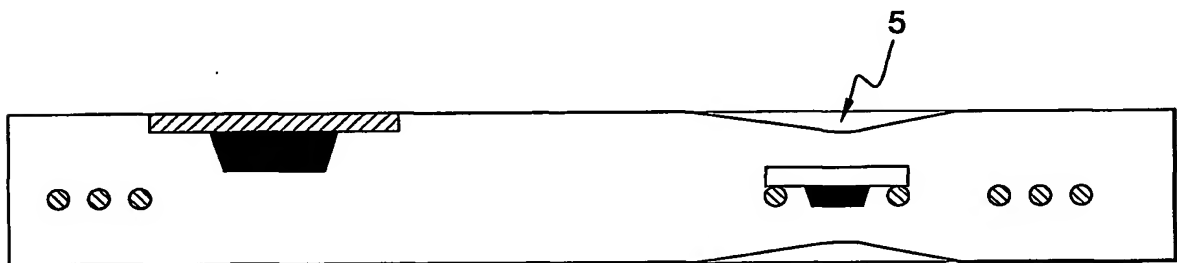


Fig. 2

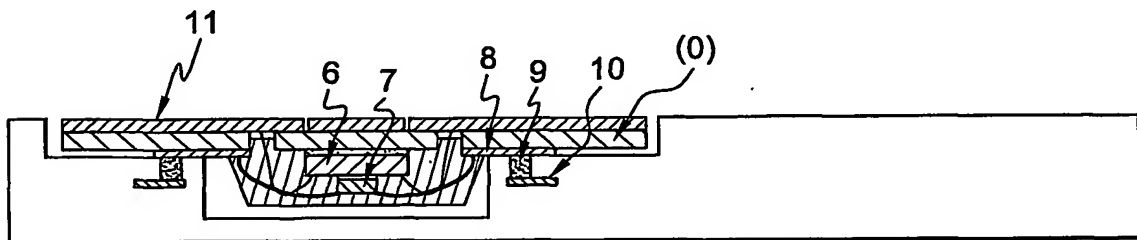


Fig. 3

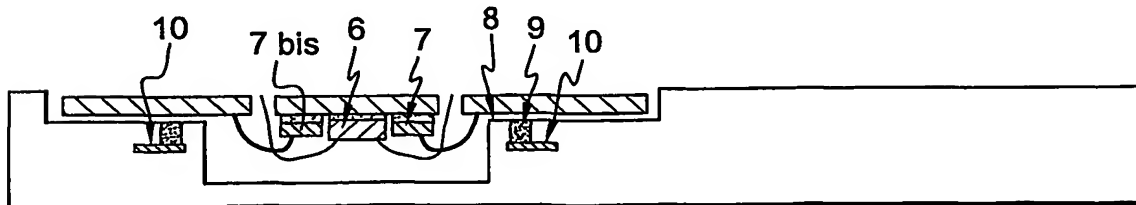


Fig. 4